IN THE SUBSTITUTE SPECIFICATION

Please cancel paragraphs 004, 007, 012, 013, 018, 019, 026, 027, 028, 029 and 036 of the Substitute Specification which was filed with the subject application. Please replace these cancelled paragraphs with replacement paragraphs, also 004, 007, 012, 013, 018, 019, 026, 027, 028, 029 and 036, all as follows:

[004] Image regulation systems for counteracting the "fan out effect" are known from DE 295 01 373 U1, from DE 42 24 235 C2, from DE 43 27 646 ~~43, 47 846~~ A1 and from EP 0 938 414 B2. In these systems the image regulators operate mechanically or pneumatically, for example.

[007] The advantages to be attained with the present invention lie, in particular, in that a transverse elongation of the material to be imprinted is, in particular, very extensively compensated for. This occurs, on the one hand, in that an image regulator, which is controlled by a control unit, reduces the material to be imprinted, in its width, in a manner adapted for counteracting the transverse elongation of the material. Preferably, the control unit takes further factors which affect the transverse elongation of the material, into consideration and thus controls the actuation of further installations, in particular in or at the cylinders, for counteracting the results of the "fan-out effect". Moreover, at the time of applying the print image to the printing forme, it is advantageous, in accordance with the present invention, to compensate for a known portion of the transverse elongation and/or for the longitudinal elongation of the material to be imprinted by the at least one printing forme, which is to be arranged on a downstream-located printing group. This can be accomplished by the ~~bythe~~ configuration and/or the positioning of a print image location on the printing forme. By this, it is possible to compensate for systematic deviations, and in particular, for deviations between printing groups following each other, to a large extent. The solution of the present invention relieves the operators of the printing press of conducting time-consuming checks of the correct position of the printing forme

containing the print image location, and of an alignment of the position of the printing forme on the forme cylinder. This advantage becomes all the greater the more printing formes are involved in the printing process. In a printing press which, for example, employs four printing colors for use in imprinting, such as, for example, a newspaper printing press with, for example, twelve printing formes on each forme cylinder, a considerable advantage results by the controlled matching of the print image locations to the print image. Otherwise, the positions of a total of forty-eight printing formes would have to be checked and aligned for fan-out compensation on the four forme cylinders. In case of a simultaneous recto and verso printing process, twice the number of printing formes, namely ninety-six, have to be aligned with each other in the above-mentioned example, because of which, an outlay of time and personnel, for checking the position of the printing formes, as well as for checking their alignment with each other, is required, which outlay can no longer be efficiently managed.

[012] In the preferred embodiment of Fig. 1, the transfer cylinders 06, which are arranged on both sides of the paper web 03 in each printing unit 02, have been placed against each other in a so-called rubber-to-rubber arrangement. The two transfer cylinders 06, which are arranged in the same printing unit 02, alternatingly each function as a counter-pressure cylinder. Alternatively, two adjoining printing units 02 can be combined into a satellite printing unit. The printing ~~Theprinting~~ groups 04 of these printing units 02 are then arranged around a common counter-pressure cylinder, which is separate from the remaining cylinders 06, 07. The paper web 03 is conducted between the counter- pressure cylinder and at least one transfer cylinder 06 which is placed against the counter-pressure cylinder in such a satellite printing unit.

[013] A further alternative for the configuration of the printing press 01 can be provided ~~provide~~ if the printing press 01 is to be configured as a job- printing press 01, and preferably as such a printing press 01 with a substantially horizontal guidance of the material 03 to be imprinted. Several successive printing groups 04 are typically provided in the printing press 01

along the production flow or travel direction P of the material 03 to be imprinted, and are preferably located on both sides of the material 03, i.e. both underneath and on top of the material 03 to be imprinted. The transfer cylinders 06 of two printing groups 04, which are arranged in a printing unit 02, are again placed against each other in a rubber-to-rubber arrangement. The material 03 to be imprinted is conducted between the two transfer cylinders 06 which are placed against each other, so that the material 03 to be imprinted passes through the area in which the two transfer cylinders 03 roll off on each other.

[018] If, in connection with a printing press 01, the distances A1, A2, A3, as shown in Fig. 1, between ink-transferring cylinders 06 of successive printing groups 09, which are arranged one behind the other in the production flow or direction P, and a mechanical elongation of the material 03 to be imprinted, and which is possibly occurring between these successive cylinders 06, as well as the moisture-caused elongation of the material 03 to be imprinted, which moisture-caused elongation has been determined, for example, in accordance with DIN 53130, are known, it is possible to determine what changes in the length L and/or in the width B of the print image locations 09, which create a common resultant print image 11 and which print image locations 09 are located in different printing groups 04, are to be expected. Therefore, a defined dimensional change is to be expected for each print image location 09, as a function of its position on the forme cylinder 07 and as a function of the intensity of the several above-mentioned influencing values, in comparison with another print image location 09 which is arranged on another forme cylinder 07 at the same relative position. The dimensional change indicates that the length L of two print image locations 09, following each other in the production flow or direction P of the material 03 to be imprinted, differs by a length factor FL. The width B of two print image locations 09 following each other in the production flow or direction P of the material 03 to be imprinted, on successive forme cylinders 07, differs by a width factor FB. In this case, the factors FL, FB can express a relative dimensional change, such as, for example,

in percent, with respect to an original length L or an original width B, or can express an absolute dimensional change, such as, for example, in the form of an amount of change which is based on an original length L or width B.

[019] Each print image location 09 is limited by its length L and width B and defines an area, as seen in Fig. 2, wherein the area of a print image location 09, which is arranged on a forme cylinder 07, is curved or arched. Its curvature is matched to the curvature of the shell face of the forme cylinder 07, in its circumferential direction Y. At the intersection of that area's diagonal lines as represented in dashed lines in Fig. 2, the area of each such print image location 09 has a center point S. Alternatively to, or in addition to the dimensional change of a print image location 09, a position, X1, Y1, of the center point S of a first print image location 09 can also differ, in comparison with a position, X2, Y2, of a second print image location 09, which is also correlated with the resultant common print image 11, on a subsequent forme cylinder 07 which follows in the production flow P of the material 03 to be imprinted. These print image locations 09 are preferably each arranged on a printing forme 08. The printing formes 08, with the first and second print image locations 09, which differ in the position X1, Y1, X2, Y2 of their center points S, are arranged in the same respective position on the respective forme cylinders 07. Thus, the printing formes 08, with their respective print image locations 09, remain fixed in place on their respective forme cylinders 07. Only the positionX1, Y1, X2, Y2 of at least one of the center points S of two successive print image locations 09, which are following each other in the production flow or direction P of the material 03 to be imprinted, is displaced. Only the positions X1, Y1,X2, Y2 of the center points S of these respective print image locations 09 are changed in relation to each other, by a distance W, as seen in Fig. 2, without changing the position of a printing forme 08 on its respective forme cylinder 07. The distance W is located in the same plane as is the area defined by the length L and the width B of the print image location 09, and can show the displacement of the center

point S in this plane in any arbitrary direction, in comparison with the position X1, X2 of the center point S of the related print image location 09.

[026] The forme cylinder 07 and/or the transfer cylinder 06, which transfers ink, of at least one of the two printing groups 04 that are arranged one after or behind the other in the production direction P is preferably driven by a controllable drive mechanism 40, which is ~~isnot specifically~~ represented schematically in Fig. 3 and which may be configured, such as, for example, ~~by~~ an electric motor, and in particular ~~by~~ a frequency-controlled motor. However, each one of the forme cylinders 07 and/or the ink-transferring cylinders 06 of all printing groups 04, which are arranged one behind the other, may be individually driven. When using controllable drive mechanisms 40, a phase relation, which is assumed with respect to each other of the forme cylinders 07 and/or of the ink-transferring cylinders 06 of at least two printing groups 04, can preferably be controlled as a function of the factor DL of the longitudinal extension. Because of the controllable phase relation of the forme cylinders 07 and/or of the ink-transferring cylinders 06, it is possible, in particular, to affect a circumferential register of the forme cylinders 07.

[027] The actuator, and/or the phase relation of the forme cylinders 07 and/or the phase relation of the ink-transferring cylinders 06, are preferably continuously controllable. The actuator, and/or the phase relation of the forme cylinders 07 and/or of the ink- transferring cylinders 06, are preferably controllable in the running production flow or direction P of the material 03 to be imprinted. In particular, the actuator, and/or the phase relation of the forme cylinders 07 and/or of the ink-transferring cylinders 06, are controllable, such as, for example, from a control console 42, as is depicted schematically in Fig. 1, and that is assigned to the printing press 01 or from another central control unit, i.e. they can be remotely controlled.

[028] It is advantageous to provide a memory unit which is connected with the control unit or control console 42 for at least one of the printing groups 04. The memory unit contains at least one value for the factor FL of the length L of two print image locations 09 which are located behind each other in the production flow or direction P of the material 03 to be imprinted and/or at least one value for the factor FB of the width B of two print image locations 09 which are located behind each other in the production flow or direction P of the material 03 to be imprinted. Alternatively, or additionally, the memory unit can contain at least one value for the factor FL of the length L of two print image locations 09 which are located side- by-side on the same forme cylinder 07 and/or can contain at least one value for the factor FB of the width B of two print image locations 09 which are located side-by-side on the same forme cylinder 07. Furthermore, the memory unit can contain at least one value for the different positions X1, Y1, X2, Y2 of the center point S of two print image locations 09 which are located side-by-side on the same forme cylinder 07.

[029] The control unit can track the center point S of at least one print image location 09, which tracked center point follows a different print image location 09 in the production flow or direction P of the material 03 to be imprinted, with respect to the center point SB of the print image 11 to be imprinted, which center point was displaced during a running printing process, such as, for example, by the longitudinal elongation and/or by the transverse elongation of the material 03 to be imprinted, as seen in Fig. 3. In the process, the control unit controls at least the actuator and/or the phase relation of the forme cylinder 07 and/or of the ink-transferring cylinders 06, preferably as a function of the value for the factor FL and/or the factor FB and/or the positions X1, Y1, X2, Y2 of the center point S which is stored in the memory unit. For example, the center point S of the print image 11 to be imprinted is detected by a ~~bya~~ detector unit 44, as shown schematically in Fig. 1, and which is connected with the control unit 42, such as, for example, a device which optically detects and digitally evaluates the print image 11, and

which may be, for example, a semiconductor camera with a CCD sensor. For example, the control unit 42 can operate devices, which are connected with it, with the result that the center points S of the print image locations 09 which print a common print image 11 are brought into agreement with the center point SB of the common print image 11 to be imprinted.

[036] It is furthermore possible, in accordance with the present invention, to counteract at least a part of the transverse elongation of the material 03 to be imprinted by employing an image regulator 38, as depicted schematically in Fig. 1 wherein, prior to its entry into a subsequent or following printing group 04, the material 03 to be imprinted is deformed, preferable in a wave shape, by the image regulator 38 transversely to its production direction R. In this way, the material 03 is reduced, in its width B03, in a manner which counteracts the transverse elongation, as seen in Fig. 3 ~~inFig. 3~~. Preferably, the intensity or the extent of the width reduction takes place at a reverse ratio with respect to the factor DQ of the transverse web elongation, and can preferably also be changed in the course of the ongoing printing process. The deformation of the material 03 to be imprinted can take place, for example, mechanically by the use of rollers which are preferably placed against both sides of the material 03 to be deformed. To prevent the occurrence of negative effects on the quality, these rollers preferably act outside of the print image 11 on the material 03 to be imprinted and are preferably individually rotatorily driven. Another embodiment of the image regulator 38 provides at least one air nozzle that is directed onto the surface of the material 03 to be imprinted. This at least one air nozzle, for example, permits compressed air to flow against the material 03 to be imprinted. In this way the air nozzle deforms the material 03 to be imprinted in a contactless manner. Preferably, several such air nozzles are provided in connection with this pneumatic image regulator 38, which air nozzles are spaced apart from each other. Preferably at least three air nozzles are provided, wherein the air flow of an air nozzle, which is arranged between two other air nozzles is preferably directed counter to the air flow direction of its adjoining air

nozzles. The result is that the material 03 to be imprinted, which is charged with the air flow, is deformed in a wave shape. With use of the mechanical, as well as with use of the pneumatic image regulator 38, the deformation of the material 03 to be imprinted can preferably be continuously controlled within defined limits by a control unit which controls the image regulator 38. In particular, this deformation can be controlled remotely from a control console which is part of the printing press 01. The control unit can change the center point SB of the print image 11 by actuating the image regulator 38.